

Long term beach nourishment impacts in interaction with environmental factors on the abundance of four dominant intertidal macro invertebrate species

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Coastal squeeze is the largest threat for sandy coastal areas. To mitigate seaward threats erosion and sea level rise, sand nourishments are commonly applied. However, its long term consequences on the macro invertebrate fauna critical to most ecosystem services of sandy coasts are still unknown. Seventeen sandy beaches nourished and controls were sampled in a chronosequential manner to investigate the abundance of four dominant macro fauna species and their relations with time since nourishment and relevant coastal environmental variables. Nourishments and environmental variables together explained the recovery of *S. squamata*, *H. arenarius* and *B. sarsi*. For *E. pulchra*, no environmental variable explained its abundance. Recovery took place within a year after nourishment. *S. squamata* even profited from the nourishments with increasing abundances after nourishment, taking into account its latitudinal gradient on the Dutch beaches. This confirms its role as an opportunistic species, therewith altering the initial community structure on a beach after nourishment. Beach nourishments do thus not seem to have long term negative consequences for the abundance of the four species. Responses to nourishments and environmental variables were species specific. This shows the importance of knowing the autecology of the sandy beach macro invertebrate fauna in order to be able to mitigate the effects of a beach nourishment and other environmental impacts.